

April 18, 2017

A Board meeting of the Electric and Water Plant Board of the City of Frankfort, Kentucky, was held at the Career and Technical Center as Franklin County High School, located at 1106 E. Main Street, Frankfort, Kentucky, on Tuesday, April 18, 2017 at 5:00 p.m.

ATTENDANCE:

Ralph Ludwig, Board Chair
Walt Baldwin, Vice Chair
Anna Marie Pavlik Rosen, Board Member
John Cubine, Board Member
James Liebman, Board Attorney
Herbbie Bannister, General Manager
David Billings, Water Engineer
Katrina Cummins, Asst. Finance Director
David Denton, Finance Director
Sharmista Dutta, Water Engineer
Vent Foster, Asst. GM Operations/Chief Electric Engineer
Monique Gilliam-Avery, Customer Service Director
Dana Goodlett, Cable Installation Supervisor
Ryan Henry, Asst. IT Director
John Higginbotham, Asst. GM Cable/Telecommunications
Scott Hudson, Electric Superintendent
Casey Jones, IT Director
Cathy Lindsey, Public Information Officer
Kathy Poe, Executive Assistant
Kim Phillips, Safety Director
Hance Price, Staff Attorney/Asst. GM Administration
Mark Redmon, Support Services Director
Julie Roney, WTP Superintendent
Dianne Schneider, HR Director
Alan Smith, Water Dist. Superintendent
Jeremy Blackburn, Cable 10 Videographer
Alfred Miller, State Journal
Talmage Mincey, CROM International
Adam Webber, Strand Engineers
Glenn Price, Frost Brown Todd

AGENDA

The Agenda for the Board Meeting was received and entered into the Minute Book as follows:

April 18, 2017 BOARD MEETING AGENDA

1. **Action Item:** Consider Approving Minutes for the March 21, 2017 Special Board Meeting.
2. **Action Item:** Consider Approving Minutes for the March 27, 2017 Special Board Meeting.
3. **Action Item:** Accept Electric, Water and Cable Financial & Statistical Data for March 2017.
4. **Informational Item:** Public Comment Period.
5. **Informational Item:** Departmental Reports:
 - Website Customer Comments

- Cable Dept.
- Tanglewood
- Customer Service
- Electric Dept.
 - SEPA
- KyMEA
- Safety
- Water Distribution
- Water Treatment Plant
- Administration Building

6. **Action Item: Consider Reservoir Roof Options.**
7. **Informational Item: Cable Skinny Bundle Offering.**
8. **Action Item: Consider Changes to the FPB Employee Health Plan Summary Plan Description for Short-Term Disability Benefits, Effective May 1, 2017.**
9. **Action Item: Consider Amendments to the Job Classification and Compensation Plan to Create Two New Job Descriptions in Water Treatment and Reclassify One Position in the Water Distribution Department.**
10. **Action Item: Approve Letter to Frankfort Independent School.**
11. **Informational Item: General Manager's Comments.**
12. **Request Permission to have Chair call for a Closed Session** Chairman moves for a closed session pursuant to KRS 61.810(1)(c) for the discussion of proposed litigation regarding zoning matters related to Tanglewood, for the discussion of litigation regarding Genesco Pump Station and to discuss pending litigation regarding Shelton/Marrillia.
13. **Closed Door Session:**

BOARD ACTION

Mr. Ludwig called the meeting to order. Ms. Poe called the roll and noted five (5) Board members in attendance.

1. **Action Item: Consider Approving Minutes for the March 21, 2017 Special Board Meeting.**

Mr. Cubine moved to approve the minutes for the March 21, 2017 Special Board meeting and the March 27, 2017 Special Board meeting. Mr. Ludwig seconded. Mr. Ludwig called the vote and the motion passed unanimously.

2. **Action Item: Consider Approving Minutes for the March 27, 2017 Special Board Meeting.**

Approved in Item 1.

3. **Action Item: Accept Electric, Water and Cable Financial & Statistical Data for March 2017.**

Mr. Denton stated that FPB is a municipal non-profit and explained the manner in which funds collected are utilized. He discussed the statement of net position for the period ending March 31, 2017. He discussed assets, debt, liabilities, capital assets, cash and investments, and expenses and revenues. He further discussed bonds, leases and loans payable, and the financial performance companywide.

In response to Mr. Cubine, Mr. Denton explained revenue calculations and budget estimates for the fiscal year 17-18. He further discussed trends in each department and how they will effect budget estimates.

Mr. Cubine moved to accept the financial and statistical data. Ms. Rosen seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

4. **Informational Item: Public Comment Period**

Mr. Ludwig opened the floor for public comment.

Mr. Joel Fischer stated that he was the president of the South Frankfort Neighborhood Association and discussed the following recommendations: 1) meeting minutes and agendas should be posted on FPB's website in a timely and organized fashion; 2) transparency should be revisited by posting meetings to YouTube in timely fashion or in the alternative perhaps only audio could be supplied; 3) Board and Staff should take notice of the op-ed in State Journal concerning public involvement being key to progress at the municipal level. He stated that the South Frankfort Neighborhood Association fully supports this idea and believes it is important that the community pay attention to such matters and be involved where possible. Some options regarding the reservoir issues did not seem to be communicated to the public, given scope he would like to see a portion of the website dedicated to the reservoir project from conception to completion; and 4) that all FPB projects pass through planning and zoning even if they are exempt.

5. **Informational Item: Departmental Reports:**

Cable: Mr. Goodlett explained graphs and numbers provided to the Board. He discussed trouble call numbers and issues, outage numbers, customer penetration numbers and VOD views as compared to budgeted numbers.

Mr. Higginbotham discussed the Engineering Associates report. He requested that the Board contact him if there was any specific information that they would like included in the report.

In response to Mr. Fischer, Mr. Higginbotham explained that videos of the board meetings were played back on FPB TV on Wednesday and Thursday following the board meeting and then uploaded to YouTube on Friday morning. He stated that FPB had been uploading videos unedited to YouTube for nearly a year.

Mr. Baldwin requested that links to YouTube videos be added to the main website and for staff to research the possibility of making audio available on sound cloud as soon as possible after the meetings.

Website Customer Comments: There were no website comments to report.

Tanglewood: Mr. Bannister stated that staff continued to work on and discuss solutions for a constructible fence with the least impact on customers and existing utilities at the headend site. He stated that a cost estimate for a fence on grade with brick columns was provided on April 11, 2017 and that Mr. Cubine and Mr. Baldwin met with Tanglewood residents to discuss these options. He advised that staff was looking for directions on the type fence acceptable to Tanglewood residents and the Board.

In response to Mr. Cubine, Mr. Nickerson advised that once the fence specifications were complete, the bid could take place within 45-60- days. Mr. Bannister stated that the design of landscaping was on hold until a decision is made on the fence.

Customer Service: Ms. Avery gave an update on cycle billing. She discussed the types of customer communications and notifications by FPB as well as discussions regarding cycle billing changes at City and County meetings.

In response to Mr. Cubine. Ms. Avery explained that billing for the first cycle had already taken place and that customer service had already received numerous calls and explained how things would work. She further explained that FPB was working with customers who need assistance.

Electric Dept.: Mr. Hudson explained information regarding outages and explained the total number of customers effected for the month of March. He further explained the types and causes of electric outages.

SEPA: Mr. Bannister explained information included in the SEPA graphs for the month of February 2017. He noted a loss of \$11,700 for February, a loss of \$9,700 for the year through February 2017, but noted that SEPA had been profitable since its inception. He stated that the numbers were expected to improve in mid-2018 when the major dam rehabilitation was complete but that SEPA would likely still only break even.

KyMEA: Mr. Foster stated that the last KyMEA meeting was held March 23, 2017 and that the discussion was mostly routine. He discussed upcoming transmission requirements and metering needed for those requirements.

Mr. Foster discussed the credit rating for KyMEA and advised that they had received an "A" rating with a stable outlook, which was very good. He further explained comments from the rating agency that the power purchase agreements were reasonably diversified in terms of fuel mix, asset concentration and counterparties and extremely flexible in terms of capacity nominations. The contracts include favorable extension and nomination provisions that should limit operating risk. Contract terms allow KyMEA to adjust capacity during the initial contract tenors to track load growth or lack thereof and extend certain contracts past their initial tenor at its option. Moreover, there is no requirement for KyMEA to take delivery of any energy under any of its current contracts. KyMEA expects to deliver power and energy in 2019 at wholesale rates approximately 15% below the comparable costs of each all requirements project members' existing arrangements.

Mr. Foster stated that the rating agency's power group was very impressed with the existing contracts and flexibility. He further noted that this gives the board another independent review of the current arrangements with KyMEA.

Mr. Foster explained that the RFP for renewable capacity and energy went out March 1, 2017. There had been considerable interest with approximately 90 submittals. He advised that evaluation of those options would begin very soon and that information would be disseminated to the Board once the review was complete.

Mr. Foster stated that a new RFP went out for natural gas combined cycle intermediate base load capacity and energy, and responses were due by May 5, 2017. He explained that this was to refresh the RFP for energy/capacity source to replace the Dynegy contract.

Mr. Foster stated that the next KyMEA meeting would be held on Wednesday, April 26, 2017 in Lexington.

In response to Ms. Rosen, Mr. Foster explained that the response deadline for renewable options was closed and that no other responses could be accepted. He further noted that responses were being reviewed.

In response to Mr. Baldwin, Mr. Foster explained voting on power purchase agreements for the KyMEA portfolio. He stated that all requirements ("AR") members vote on the suppliers to be included in the AR portfolio and OMU would negotiate their own terms outside of the AR portfolio as they are not currently an AR project member.

Mr. Cubine added that Mr. Bannister, Mr. Foster and Mr. Denton deserved a lot of credit for the strong "A" credit rating. He further noted that the rating was very good for the current market. Mr. Bannister stated that the credit went to Mr. Foster and Mr. Denton.

SAFETY: Ms. Phillips noted one (1) OSHA recordable accident for a back strain and no (0) vehicle accidents.

Water Distribution: Mr. Smith noted no (0) main breaks and no (0) outages for the month of March. He stated that there was a nice article in The State Journal regarding the community water fountain project and that staff had included funds in the budget for the project and planned to move forward.

Water Treatment Plant: Ms. Roney stated that the water treatment plant produced 238.8 million gallons of potable water with an average daily production of 7.7 million gallons per day. She further discussed rainfall and river flows.

Administration Building: Ms. Dutta discussed work at the administration building. She advised that contractors were wrapping up work and continued to finalize items on the punch list. She stated that approximately 85% of punch list was complete, and that staff continues to prepare and organize for relocation.

6. **Action Item: Consider Reservoir Roof Options.**

At the March Board meeting, the Board directed staff to invite a tank manufacturer to discuss capital and maintenance costs of roof options. As a matter of course, CROM International will make a presentation and discuss roof options for the proposed Reservoir project.

Mr. Billings introduced Talmadge Mincey with CROM International. Mr. Mincey made a brief introduction and discussed his presentation. He stated that FPB had done a good job researching the options. He further noted that there was no other viable option to store the volume of water necessary for this community for this amount of money.

Mr. Mincey discussed tanks built by CROM in or around Frankfort and Franklin County. He explained the history of pre-stressed concrete storage tanks, the standards by which these tanks are built, the number of tanks built, the longevity and benefits of the tanks, and the tank anatomy and roof options.

Mr. Mincey explained specifics of the 1/10th rise and 1/16th rise domed roof options. In response to Mr. Cubine, Mr. Mincey advised that the 1/16th rise was the lowest dome that could be done. Mr. Mincey further reviewed tank renderings for each roof options provided to the Board. He stated that the renderings included the wall of the existing reservoir for reference only and that the plan was for the existing backfill to go back in place after construction. He further stated that the 1/16th rise would cost an additional \$500,000 due to the additional thickness and steel, formwork and shoring necessary to build. In response to Mr. Ludwig, Mr. Mincey stated that the 1/16th rise was about 7 feet lower than the 1/10th rise.

Mr. Mincey reviewed and explained the rendering for the column supported flat roof. He advised that the flat roof would be much thicker and would require additional 2 feet of wall height. He further advised that the flat roof would cost about \$1.75 million more than the 1/10th rise dome. Mr. Mincey explained that cleaning and maintenance

would be more difficult and costly for the flat roof. He advised that the vast majority of covered water storage was built with a dome roof because it is more efficient.

Mr. Mincey explained safety and building codes. He specifically explained how the tank would be built to withstand weather and other natural disasters.

Mr. Mincey reviewed photos of water tanks incorporated into other neighborhoods for reference and explained that the tank could be painted a soft color to better blend with the surroundings.

In response to Ms. Rosen, Mr. Mincey explained improvements to the concrete tanks. He further explained that the life expectancy of the roof types was similar but that more attention would be needed for inspection and maintenance on the flat roof and that there was no difference for maintenance in the dome rooves. In response to Mr. Cubine, Mr. Mincey reiterated that maintenance and inspections for the columns on the flat roof would be more detailed and costly.

In response to Ms. Rosen, Mr. Mincey explained the reasons for flat roof choices. He stated that some were built underground, some had aerators on the rooves and others were built in the Middle East with flat rooves so they could be easily camouflaged.

In response to Mr. Cubine, Mr. Mincey stated that they have walked the site and that CROM had built tanks in much tighter spaces. He explained the diligence in protecting surrounding areas and properties.

At this point in the meeting, Mr. Cubine thanked Mr. Mincey and staff for the presentation and work. Mr. Cubine requested that additional renderings from different perspectives be prepared as soon as possible for Tanglewood to review and call a special meeting if necessary. Mr. Cubine further stated that the 1/16th dome seemed to make a significant difference in profile. Mr. Bannister requested specifics on what renderings the board wanted to see.

In response to Mr. Cubine, Mr. Mincey explained typical colors for tanks. He noted soft tones with little contrast to the surroundings are best and are easy to keep clean. Mr. Billings noted that the standard would be to stay away from dark colors.

In response to Mr. Ludwig, Mr. Mincey stated that the height difference in the two dome roof types would make the most difference from longer distance and that the wall height would be more apparent with the lower dome at a closer distance.

After additional discussions regarding renderings and 3D models, it was decided that this item would be tabled, that staff would contact the Career and Technical Center (CTC) or other entity for assistance with a photo realistic 3D model to be viewed from all vantage points or provide renderings of the three (3) tank options and contact Ms. Gray regarding which vantage points TNA would like to see. Mr. Bannister explained that costs for the additional renderings will increase and that he would communicate that cost to the Board prior to proceeding with the work.

In response to Mr. Ludwig regarding discussion of building two smaller tanks with flat rooves instead of one large tank, Mr. Billings and Mr. Webber explained that the cost would more than double to \$8.2 million to build two 4.6 million gallon tanks with flat rooves and there would be no room for additional growth if needed in the future. Mr. Billings stated that the process would be the same.

Mr. Baldwin requested that summary documents of all tank options and costs be sent to TNA and posted on the FPB website.

Mr. Ludwig reiterated the prior Board decision to build one 7 million gallon tank and to line the North basin to protect against leaks. He further noted follow up to be completed with regard to the renderings and moving forward with the project.

7. **Informational Item: Cable Skinny Bundle Offering.**

Staff was asked at the February 7, 2017 public hearing on cable rates to investigate the feasibility of creating a skinny bundle offering. Staff spoke to multiple operators who have similar offerings, explored contractual restrictions with NCTC staff, and discussed technical requirements and potential roadblocks with the FPB Cable headend and installation departments. Staff is soliciting feedback from the board for next steps in this project. Should the board decide to pursue this option, staff would engage the Cable Advisory Committee to finalize the lineups and make a final recommendation to the board of directors. Any new tier would require establishment of new rates through a public hearing process.

Mr. Couch reviewed and explained the results of the investigation into potentially offering a skinny bundle. He acknowledged that nearly all the cable channels offered were owned by nine (9) companies which increases the leverage for those companies to force carriage of less desirable channels.

Mr. Couch explained the concept of the skinny bundle and advised that this would be a retention tier for FPB. He further explained contract language that makes offering a tier like this difficult. He stated that this tier would be limited to 10% of FPB's total cable customers resulting in a constantly moving target. He further advised that significant penalties would be levied if FPB were to go over the penetration cap. He advised that a decision on how to handle the service offerings if the penetration cap was exceeded would have to be made.

Mr. Couch explained that channel offerings on the skinny bundle would need to be encrypted therefore customers choosing this package would be required to rent an advanced set top box for each television in their home on which they want cable channels to be available. He further discussed installation and fees associated with this bundle, the impact on the existing network due to using bandwidth reserved for broadband expansion, and the upfront costs for FPB to get this rolling.

Mr. Couch reviewed and discussed tiers for the skinny bundles, channels included and the customer charges. He explained that the total minimum for one television would be \$43.53. He further explained cost comparisons with existing tiers as well as the advantages and disadvantages of the skinny bundle.

Mr. Couch explained steps necessary if the Board would like to proceed and noted after the appropriate meetings and approvals, the package could be ready to offer to customers by late summer.

Mr. Cubine reiterated costs of current packages and stated that customers need to be surveyed regarding interest in this new package. Mr. Couch stated that other providers have had good interest but have had issues with the penetration cap. He stated that a survey would need to focus on the demographic that would be most affected by this change.

Mr. Higginbotham discussed varying experiences other companies have had and reiterated that the penalties for exceeding the penetration cap are extreme and cause the biggest obstacle with this type of package. He stated that the NCTC is looking to serve the customers in many ways and have negotiated well for the carve outs in the contracts.

Mr. Cubine stated that he would like to see the customers surveyed regarding interest for new bundle and retransmission at same time, and also finalize skinny bundle line-up with Cable Advisory Committee.

8. **Action Item: Consider Changes to the FPB Employee Health Plan Summary Plan Description for Short-Term Disability Benefits, Effective May 1, 2017.**

FPB provides self-funded short-term disability benefits to regular full-time employees to protect the incomes of employees during periods of prolonged illness

or injury that is not work related by providing salary continuation at 60% of base pay. There is a one-year waiting period for new employees and a 30-day elimination period, which must be satisfied before employees are eligible for benefits. Benefits continue for a maximum of 22 weeks. Employees who are unable to return to work at the end of the short term disability coverage period may be eligible for long term disability coverage pending approval from his/her physician and the insurance carrier.

Staff asks the Board to consider adding the following language to the Short-Term Disability policy:

- While receiving Short-Term Disability benefits, participants shall not be engaged in any other employment whether through another employer, self-employment or otherwise.
- Short-Term Disability benefits paid to the employee in error will be recovered by FPB. In situations of overpayment, FPB will recover the overpayment directly from the employee or his/her next pay.

Ms. Nichell Brown discussed new proposed language as stated above. At the request of Ms. Rosen, Ms. Brown defined FPB's short-term disability plan. In response to Mr. Cubine, Ms. Brown explained that currently an FPB employee could be receiving short-term disability benefits and still work a part time job outside of FPB.

Mr. Cubine moved to approve the policy changes. Ms. Rosen seconded. Ms. Poe called the vote by member and the vote passed with a 4-0 vote.

9. **Action Item: Consider Amendments to the Job Classification and Compensation Plan to Create Two New Job Descriptions in Water Treatment and Reclassify One Position in the Water Distribution Department.**

A copy of the organizational chart, revised list of authorized positions, and updated job descriptions are included in the detail pages for this Board item.

1. Water Treatment Plant Operator I and Water Treatment Plant Operator II:

Staff asks the Board to consider approving two new job titles/positions at the water treatment plant. Kentucky regulations require water treatment plants to staff all operating shifts with Class IV-certified personnel. An exception to this rule is one shift a day may be staffed by an individual with a Class III certification. Adding the new classifications allows department management the flexibility to hire and train employees, who will gain the necessary work experience and can advance to the higher-level certification.

Recruiting certified plant operators from other systems to fill vacancies has proven difficult. Over the last several years, we have hired three operators from other utilities; two of those ended up leaving within the first year of employment. The department has also developed employees internally who have transferred from the Maintenance Operator position; however, employees in the Maintenance position do not always apply to transfer to the Operator positions, where shift work is required. Adding the two new classifications will not increase the total number of employees in the department.

Based on an evaluation of the job descriptions, the classification for the Water Treatment Plant Operator I position is 103; with a pay range of \$14.83 to \$22.25 per hour. The Water Treatment Plant Operator II position is 105 with the pay range of \$17.06 to \$25.59.

There is no increase in budgeted staff.

2. Water Distribution Operator I:

Staff asks the Board to consider approving the reclassification of the Water Distribution Operator I position. Staff requests the position be reclassified from grade 101 (pay range of \$12.60 to \$18.90 per hour) to grade 102 (pay range of \$13.72 to \$20.57) to retain and attract additional qualified candidates.

Within the last 12 months, we have had three retirements in the department and two employees transferred to positions in other departments (the Water Treatment Plant and Cable Office). Unfortunately, we have experienced difficulty finding qualified applicants for the Water Distribution Operator I position, which is the entry level classification. We currently have 4 openings for this position. After recently advertising, we received 30 applications. Fifteen applicants were selected for onsite interviews. One accepted another position and 3 never returned phone calls. All eleven remaining applicants were scheduled for onsite interviews. Four did not show up for the interview (and did not return follow up phone calls). Out of the 7 interviewed, 3 were selected for job offers. None of the 3 successfully completed the pre-employment background screening. Our background screening consists of criminal background, drug testing, employer reference, and motor vehicle record.

If we offer new hires a higher entry-level pay without adjusting the pay grade, it may create salary compression when the individuals are later promoted within the Water Distribution Operator job series. If approved, an employee in the Water Distribution Operator I position will receive a 10% increase when promoted to the Operator II position (instead of 15%).

Ms. Brown noted corrections for the proposed grades for the water distribution operators. She explained adding new classifications for water treatment plant operators. She further explained reclassifications for water distribution in order to attract and retain qualified candidates.

Ms. Roney explained mandatory State rules regarding water operator qualifications. She stated that currently FPB has no avenue in which to bring in lower level operators and training them to become class IV certified. She stated that WTP was currently short operators and that the approval of this new classification would afford management a more progressive way in which to bring in and train operators to get class IV certifications.

Mr. Cubine moved to approve. Mr. Baldwin seconded. Ms. Poe called the vote by member and the motion passed with a 5-0 unanimous vote.

10. **Action Item: Approve Letter to Frankfort Independent School.**

At the December 2016 Board meeting, the Directors approved a revised letter to FIS detailing the Internet project in conjunction with the City of Frankfort. Staff has had no further discussion with the City or FIS since January 2017 until Robert Moore emailed Staff on April 12th seeking a final copy of the letter to include for the City Commission's consideration at their April 24th meeting. Staff and has no new information to provide the Board but seeks the Board's recommendation whether to proceed as directed in December 2016.

Mr. Higginbotham explained that this was to reconsider approval of the letter dated November previously sent to Frankfort Independent School ("FIS") and that FPB would need to re-group with FIS regarding what is necessary to move forward.

Mr. Baldwin moved to approve. Mr. Cubine seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

11. **Informational Item: General Manager's Comments.**


None


12. **Request Permission to have Chair call for a Closed Session** Chairman moves for a closed session pursuant to KRS 61.810(1)(c) for the discussion of proposed litigation regarding zoning matters related to Tanglewood, for the discussion of litigation regarding Genesco Pump Station and to discuss pending litigation regarding Shelton/Marrillia.

Dr. Green moved for a closed session as stated above. Mr. Baldwin seconded. Mr. Ludwig called for the vote and the motion passed unanimously. The Board moved in to closed session.

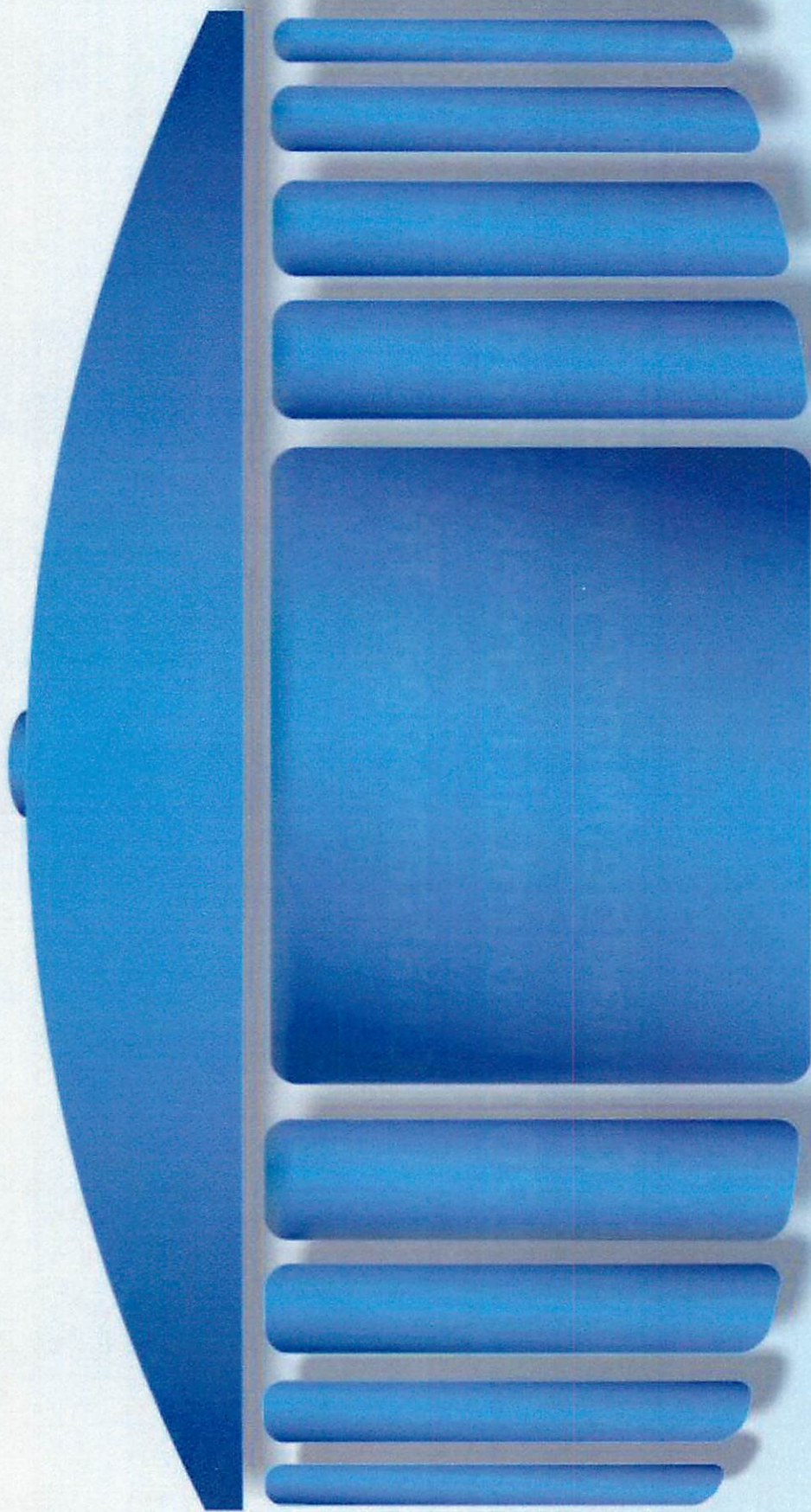
13. **Closed Door Session:**

With no further business to discuss, the meeting was adjourned.



CHAIRMAN FPZ


ATTEST:



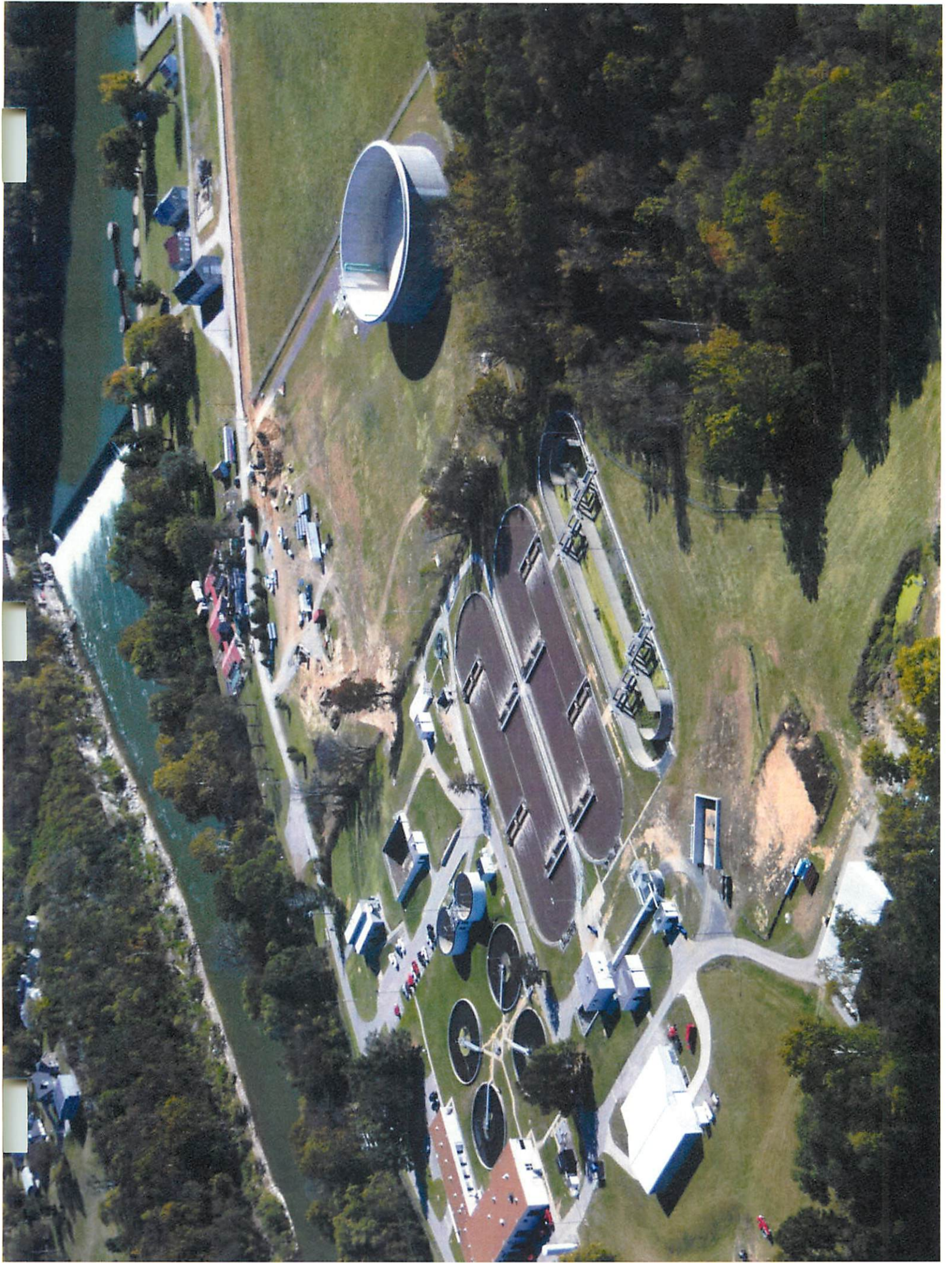
CCBROWN

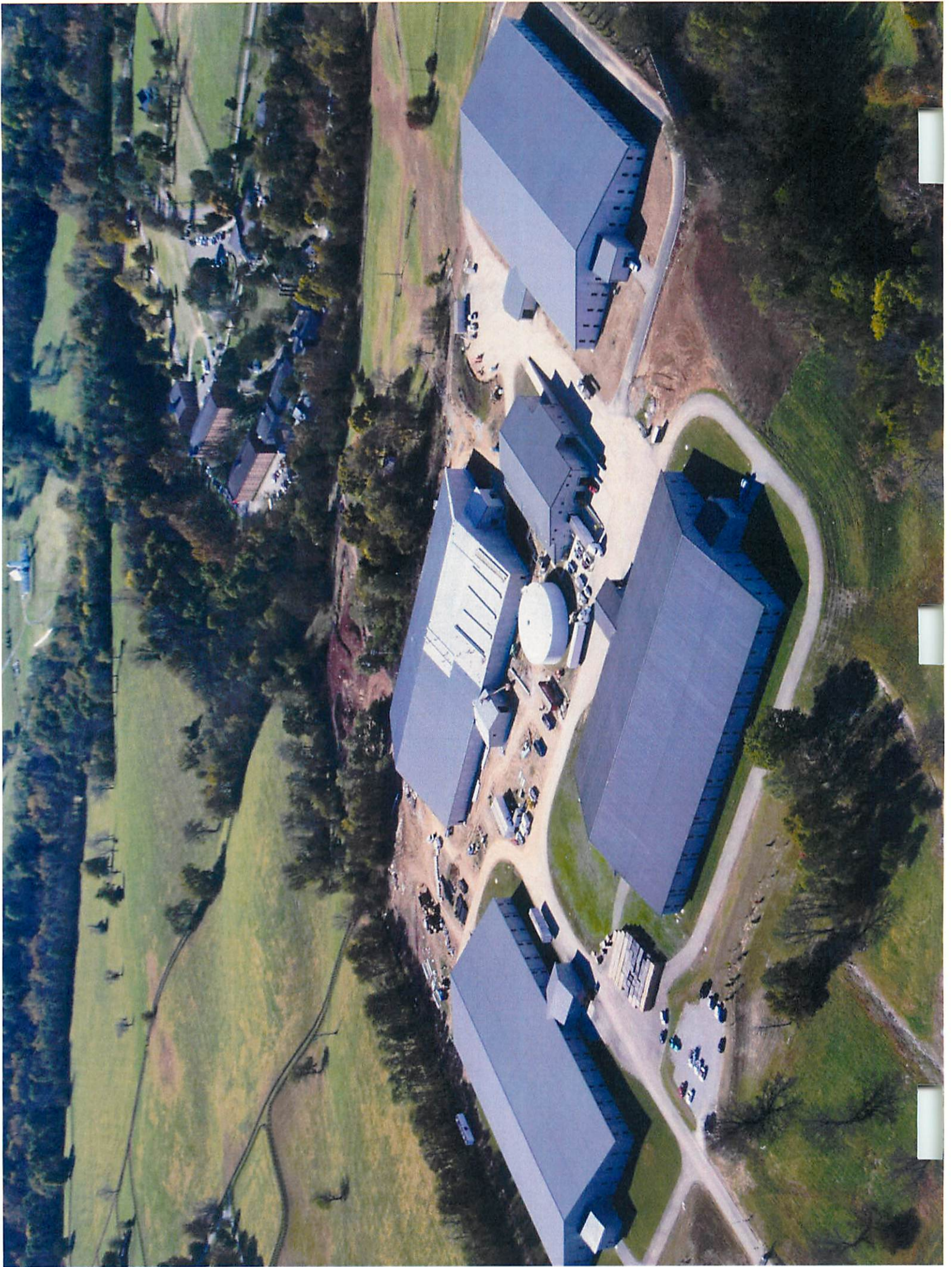
PRESTRESSED CONCRETE TANKS

CROM
Since 1953

Talmadge Mincey, P.E.*
1200 Mountain Creek Road
Chattanooga, TN

*** KY 28584, GA PE035377, FL 63091, TN 115800**

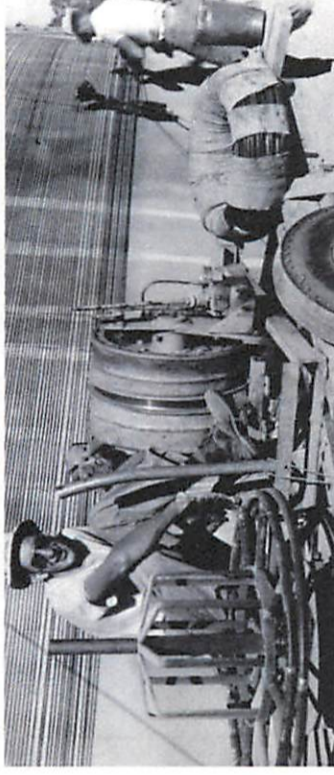
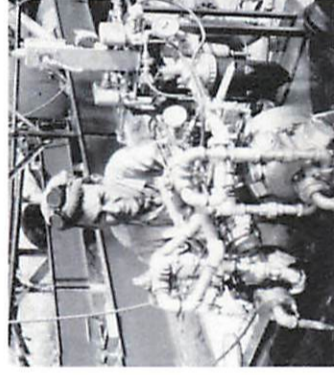








Historical Overview



- 1910:** Cement gun introduced
- 1930:** Eugene Freyssinet builds prestressed bridge
- 1935:** JM Crom and partners form tank building company
- 1953:** JM Crom founds The Crom Corporation

Prestressed Concrete Tanks

Proven Track Record

9,000+ D110/ACI 372 tanks constructed and in service

4,227 Tanks constructed by Crom to date

1955 Construction year of earliest tanks still in service

Why Prestressed Concrete Tanks?

Concrete » Low Maintenance

+

Continuous Diaphragm » Watertight

+

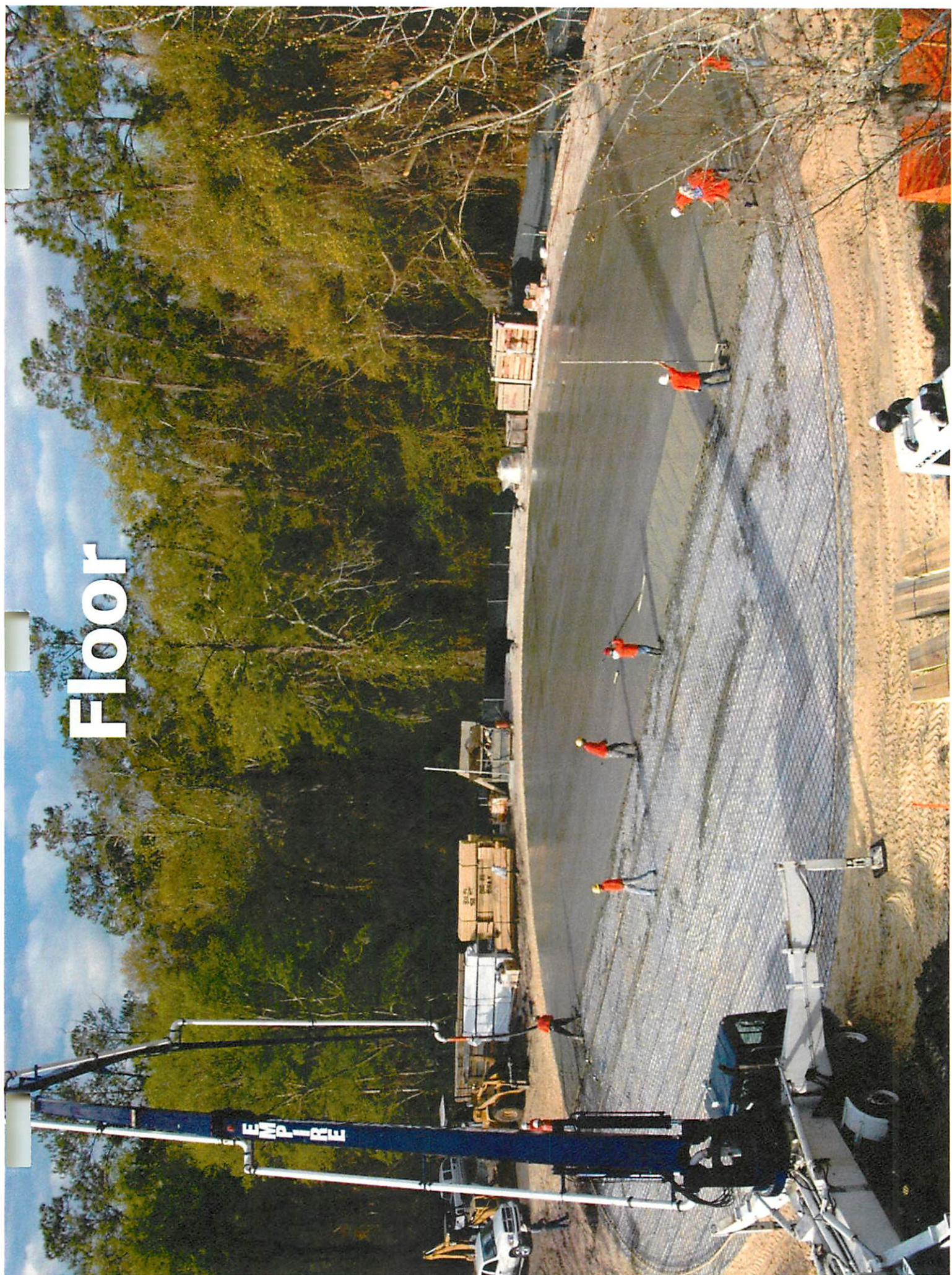
Efficient Design » Competitive Cost

Prestressed Concrete » Lowest Life-Cycle Cost

TANK ANATOMY

- **Floor**
- **Wall**
- **Roof**
 - **Free-span dome**
 - **Column-supported flat roof**

Floor



Watertight Connection



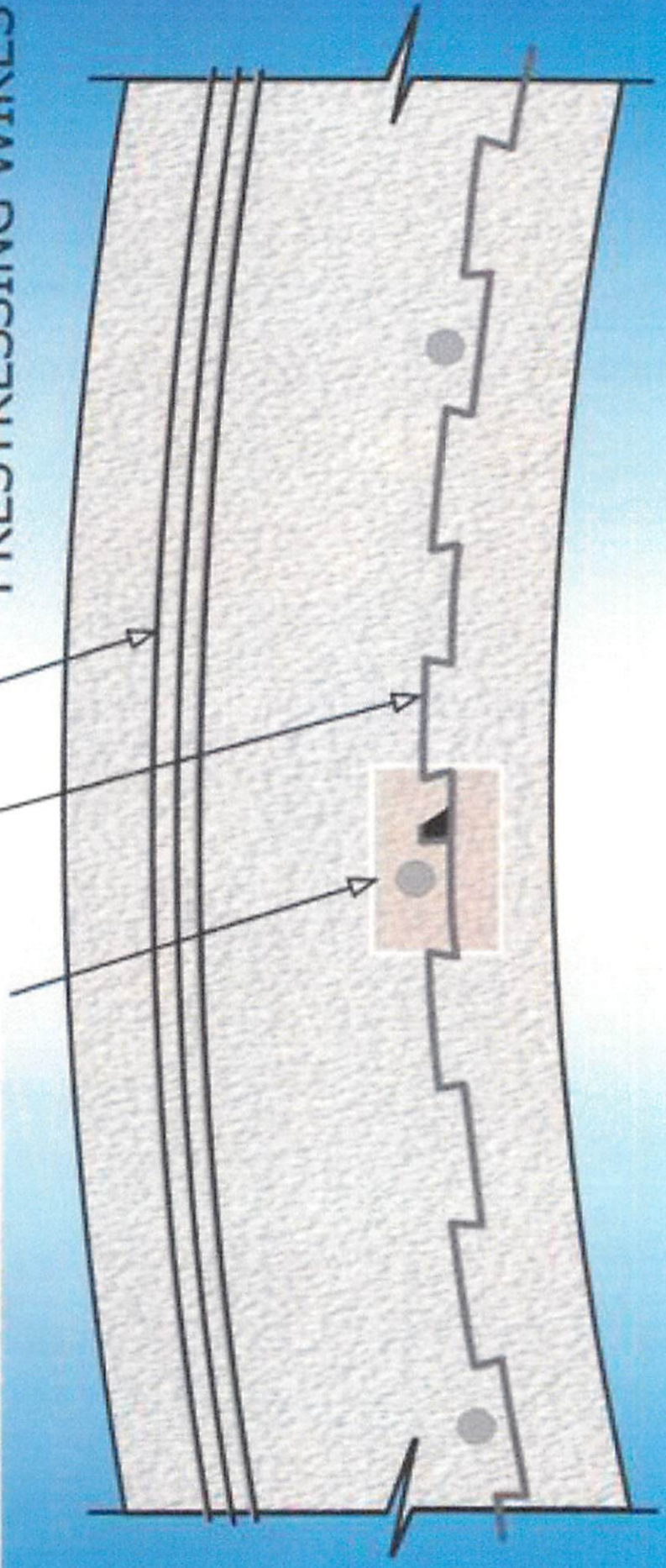
**INJECTED
EPOXY
SEAL**

TAPE

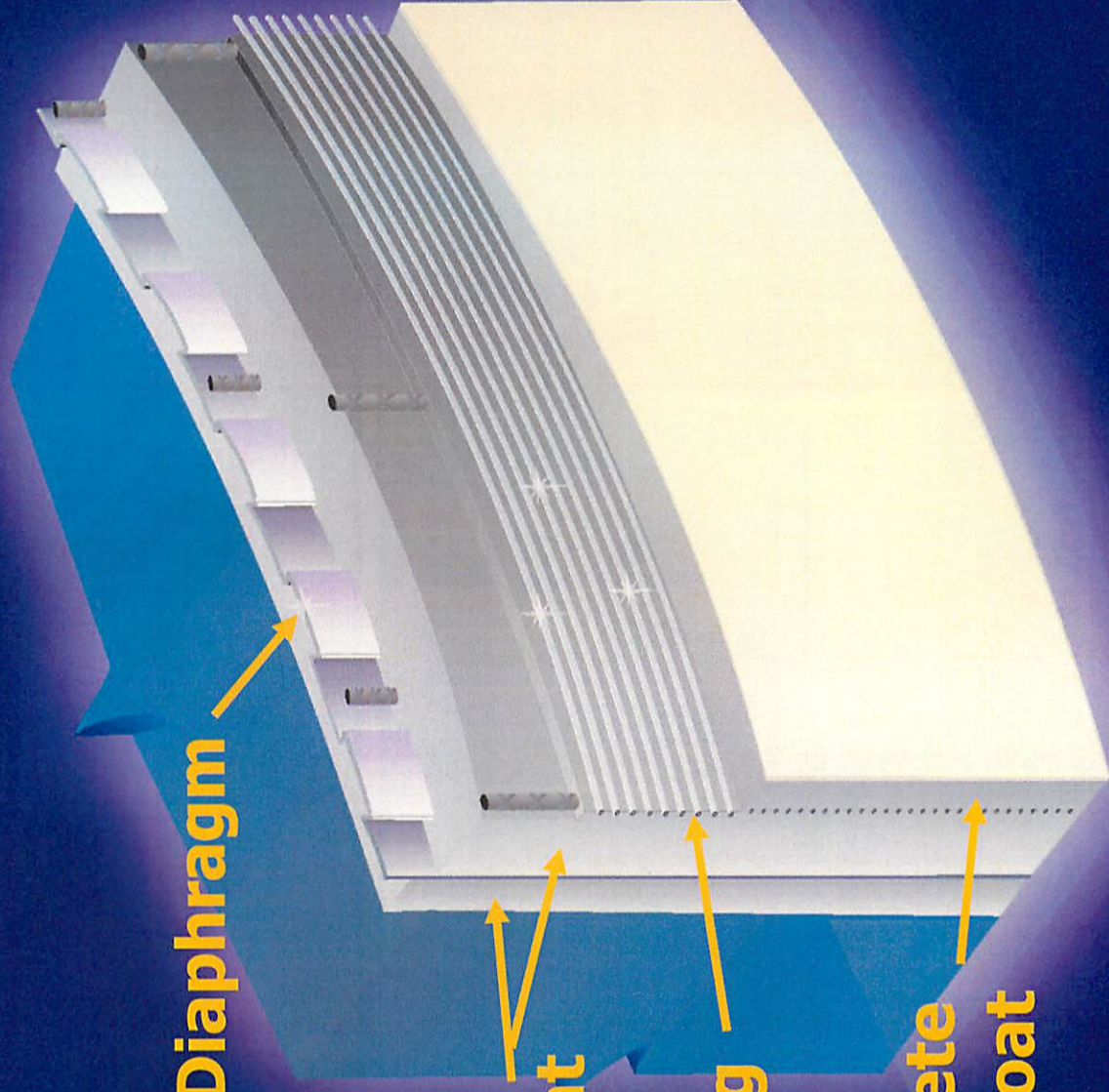
**DIAPHRAGM
JOINT**

**WATERTIGHT STEEL
DIAPHRAGM**

**INDIVIDUALLY ENCASED
PRESTRESSING WIRES**



CROM PRESTRESSED CONCRETE TANK WALL DETAIL



Steel Shell Diaphragm

**Shotcrete
Encasement**

**Prestressing
Wires**

**Shotcrete
Covercoat**



ROOF OPTIONS

Geodesic Aluminum Dome



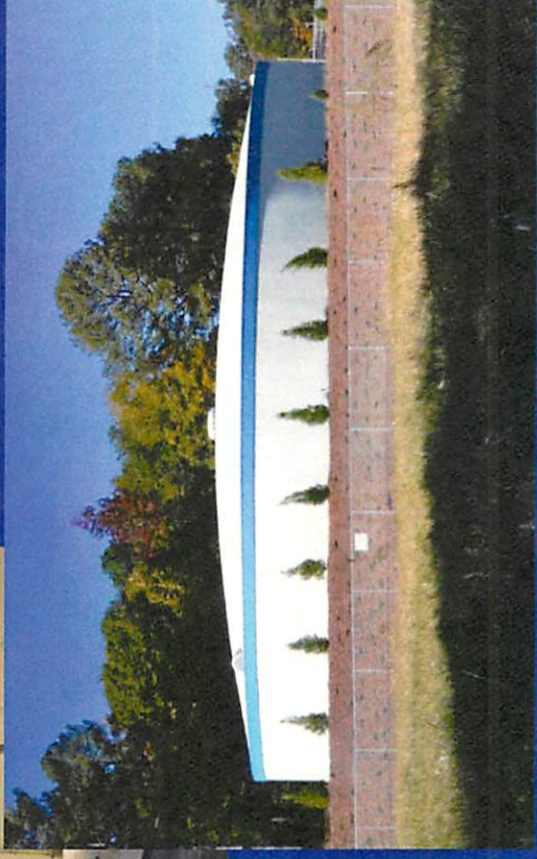
Not aesthetically pleasing.

Concrete Roof Options

1/10th Rise



Column-supported
Flat Roof



1/16th Rise

Standard 1/10th Rise Free-span Concrete Dome



Additional Cost: \$0

1/16th Rise Free-span Concrete Dome



Additional Cost: \$500,000

1/16th Rise

Free-span Concrete Dome

Additional Cost: \$500,000



Column-supported Concrete Flat Roof

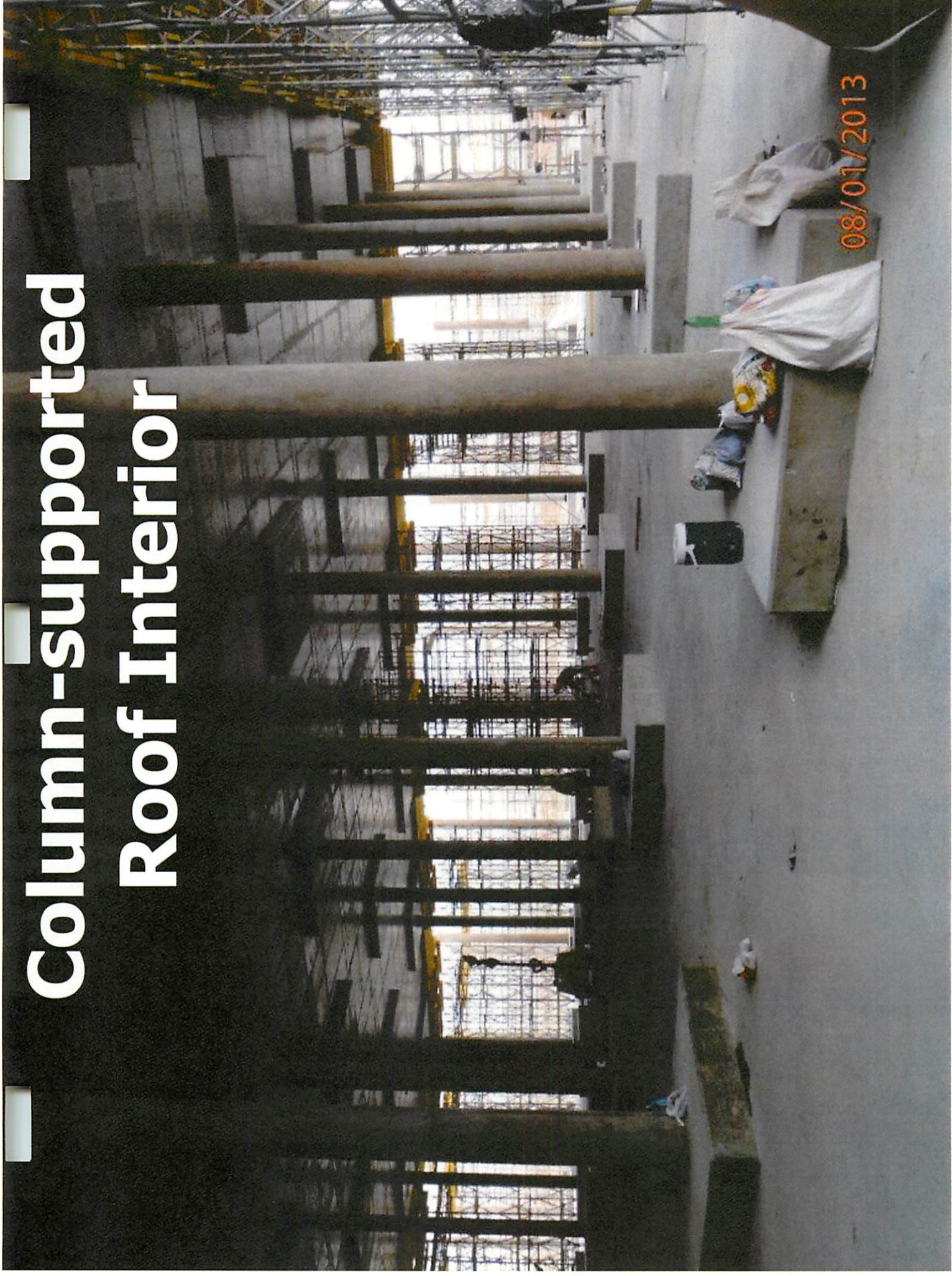


Additional Cost: \$1,750,000

Free-span Dome Interior



Column-supported Roof Interior



Installations by Cover Type

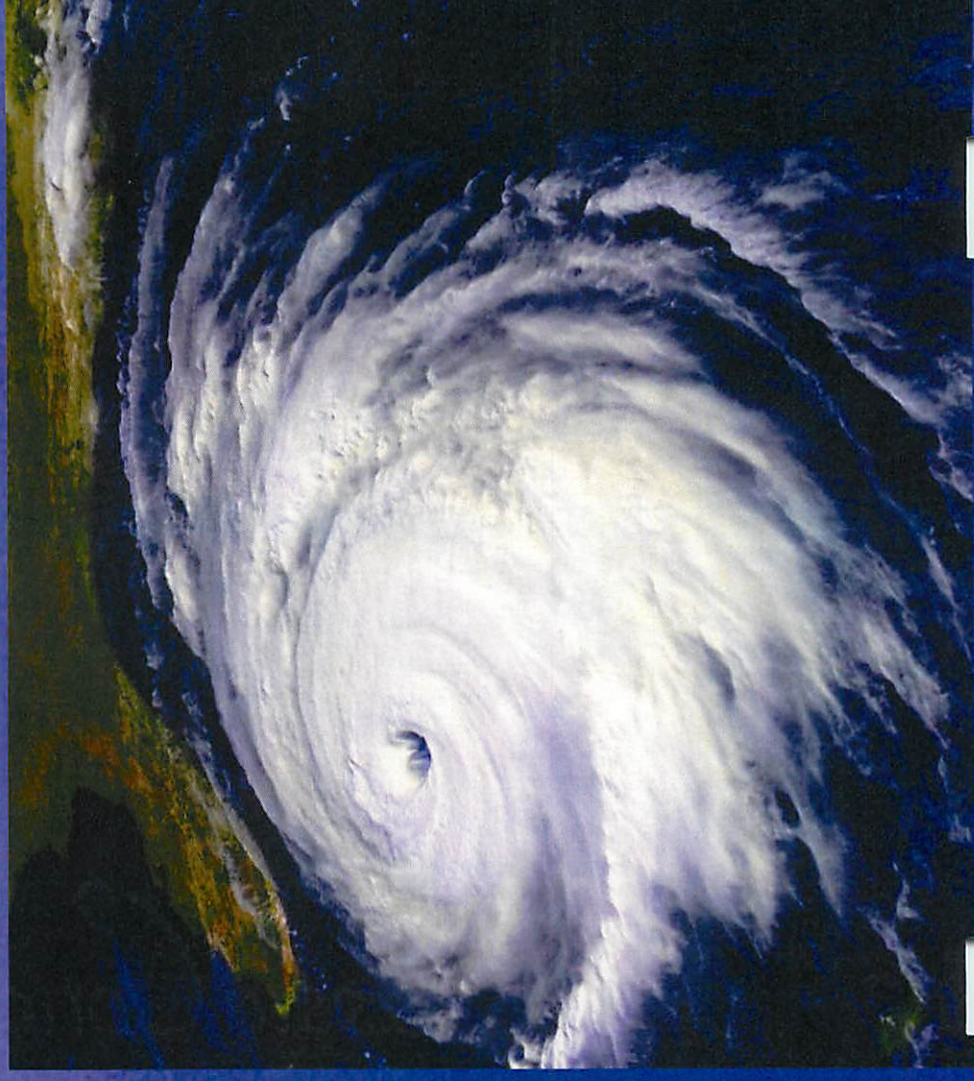
4,227	Tanks constructed by Crom
3,100	Tanks with covers
24	Tanks with flat roofs

SAFETY

Safety by Design

ASCE 7 (latest code) requires designs in the Frankfort, KY area to withstand:

- sustained wind speeds of 120 MPH
- seismic accelerations typical of a M7.0 – M8.0 earthquake









CROM
Since 1953

Talmadge Mincey, P.E.*

1200 Mountain Creek Road

Chattanooga, TN

*** KY 28584, GA PE035377, FL 63091, TN 115800**